enormous trunks of fossil trees were observed on the shores of the lake. From Lake Colhue the Rio Singuer which flows into it was ascended, until a point was reached where this stream takes an abrupt bend to the north-west. Thence the route lay for many days through the unknown uplands of the interior, until the upper waters of the Rio Chico de Santa Cruz were struck in lat. 48° 55′ 15″ S., on the last day of February. Descending the Rio Chico de Santa Cruz, the Expedition reached Beagle Bluff at the mouth of the great Santa Cruz, on March 9. Beagle Bluff, we may remind our readers, was so named from H.M.S. *Beagle*, which visited the spot in 1834, and first explored the River Santa Cruz. Darwin, who accompanied the boats of the *Beagle* in their survey of this stream, came to the conclusion that the river-valley of the Santa Cruz was formerly a strait dividing South America right across at this point, like the Straits of Magellan do now further south (see Darwin's "Naturalist's Voyage," chap. ix.).

The interior of Patagonia traversed by Sr. Burmeister's Expedition appears to be almost deserted at the present time. No natives seem to have been met with between the Chubut and the Rio Chico de Santa Cruz until the lower part of that river was reached.

From Port Santa Cruz the Expedition returned northwards along the Atlantic coast to Port Deseado in lat. 47° 56′, and thence, ascending the river of the same name, rejoined their former route on the Rio Singuer.

Besides the accurate survey made during the expedition, a large number of photographic views were taken, a selection of which will be published subsequently. These will be of interest in connection with the question of the origin of the singular "basaltic terraces" of this country, of which Darwin gave us the first indication, and which are frequently referred to by Señor Burmeister. Large collections were also made in natural history, most of which await further examination. But articles on the mammals and birds obtained during the expedition are appended to the present Report. Most of these are referred to species already fairly well known, although an exception must be made in favour of *Canis griseus*—the smaller of the two native foxes of Patagonia, of which little, if anything, has been recorded since its accurate description by Dr. H. Burmeister was published some years ago. The remaining collections still to be worked out will probably be found to contain objects of greater rarity; but there can be no doubt that the Patagonian fauna, though of great interest, is rather meagre.

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## OUR BOOK SHELF.

*The Triumph of Philosophy.* By James Gillespie (Ealing: West Middlesex Printing and Publishing Co. 1890.)

THE author has endeavoured to correct the Copernican theory of astronomy, and propounds instead the Gillespian or true system of the universe, which asserts that the earth, as well as the sun, is fixed in space and all the stars revolve round it in a year.

One of the objections to the present arrangement reads as follows:-

"Can any man in his sober senses believe that the earth could fly through space at the rate of 1000 miles a minute. Would it not drive all the atmosphere either away from the earth or like the tail of a comet? Could the moon keep her constant path round the earth at 273,000 miles distant, if she (the earth) was flying at this terrific speed?"

To understand this argument, it is necessary to believe with Mr. Gillespie that gravitation has nothing to do with the motions of any of the heavenly bodies. In his words:

"I admit gravitation on the earth, but it only extends a certain distance from the earth, and it is quite powerless at the moon's distance, otherwise the moon—if she has weight at all—would fall crash on to the earth."

The greater portion of the work is taken up with observations of Mr. J. B. Dimbleby, of the British Astronomical Society (*sic*). This gentleman, whose genius seems shrouded in obscurity, is styled "Transit Medallist, Professor of Chronology, first calculator of all eclipses and transits from Adam, and the discoverer of five lines of astronomical time." We give a short extract, in which some of his researches are referred to:—

"He has proved, by a long and by a true calculation, that the earth, the sun, the moon, Mercury, and Venus were all in one direct line at creation, and it is almost likely that the other planets were in the same position, and there they would stand like a team of racehorses till the Divine signal was given, and off they went each on his own course; and it has been proved by eclipses and transits, ancient and modern, that they have not varied a single minute since that great day."

It will be readily understood that to try to convince Mr. Gillespie of the unsoundness of his arguments would be the height of absurdity, since he has not even an elementary knowledge of physical laws. As in all similar productions, strong words and hearty abuse are indulged in to patch up weakness of argument; no one is disturbed by the tirade, however, and the Gillespian doctrine of the universe will doubtless pass away with Mr. Dimbleby and its originator.

*Watch and Clock Making in* 1889. By J. Trippling, F.R.A.S., &c. (London: Crosby Lockwood and Son, 1890.)

THIS little book consists of an account and comparison of the exhibits in the horological section of the French International Exhibition.

In England there is very little literature on this subject, but on the Continent, and in France especially, a great many works on it have been published. The chief textbook is that by M. Saunier, who has done much towards the elevation of the social position of watchmakers, and whose books are the standard works of reference on the Continent.

Twelve technical schools competed against one another at the Exhibition; great importance being attached to the technical teaching of this class of subject abroad. An excellent programme of the work which is done during the student's course is given by the author, and shows the method of teaching that is adopted.

Chronograph makers are next dealt with; of these there were twenty representatives, four being English. For performance, finish, and the number of instruments produced, England was awarded the palm. The tests which instruments of this kind have to undergo are more severe in England than in Switzerland, owing to the greater variation in temperature. For instance, one English chronometer went for twenty-eight weeks with a variation never exceeding 1·4 seconds; while a Swiss chronometer, cited as being an exceptionally good one, varied as much as 2·2 seconds in two weeks.

The next section treats of the manufacture of watches, and in this one hundred and fifty firms exhibited. This number was divided into two classes—"factory system" and "garret system"; the former consisting of those who manufactured them by using steam and hydraulic power

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for the output of the whole or part of the watch on the interchangeable system, the latter of those who still kept to the old mode of making them "under a system of subletting to small makers who work at their own homes."

Messrs. Rotheram and Sons, of Coventry, about the oldest and the largest firm of watch manufactures in England, headed the list, and seem to have had a fine display, theirs being one of the most striking exhibits in the Exhibition.

In the remaining pages the author gives an account of the merits and exhibits in the manufacture of clocks, turret clocks, tools, watch-cases, &c., concluding with a short summary.

On the whole, the British section seems to have fared very well, and to have held its own against foreign competition, and to those interested in the subject this work will afford a good insight into the present condition of watch and clock making.

*The Harpur Euclid.* Books V., VI., and XI. By E. M. Langley, M.A., and W. Seys-Phillips, M.A. (London: Rivingtons, 1890.)

THIS is an edition of Euclid's Elements revised in accordance with the reports of the Cambridge Board of Mathematical Studies and the Oxford Board of the Faculty of Natural Science.

The books dealt with are V., VI., and XI.

In most of the works on this subject Book V. is generally omitted, and only the definitions are learnt; but the authors have thought it advisable for the reader to acquaint himself with the terms used and with some of the theorems which are established in it. Although he is allowed to use these theorems as axioms, proofs are given depending on the definitions, the notation used being that recommended by De Morgan and adopted by the Association for the Improvement of Geometrical Teaching in its Syllabus and Elements.

Preceding Book XI. is a good and well worked out series of propositions on loci, harmonic division, similarity, maxima and minima; and a few miscellaneous problems, such as the nine-point circle, &c.

The proofs in Book XI. differ slightly from those ordinarily given in text-books, but are made shorter and perhaps clearer by the adoption of symbols.

The method throughout of dotting all construction lines is a great help to the reader, and is to be heartily recommended, the figures in Book XI. showing this off to advantage.

A large number of exercises are given here and there for the student to practise his ingenuity on.

*The International Annual of Anthony's Photographic Bulletin*, 1890-91. Edited by W. Jerome-Harrison and A. H. Elliott. (London: Iliffe and Son, 1890.)

THIS is the third volume that has been published of this most interesting Bulletin, and, glancing through its pages, we conclude that it is one of the best publications of its kind that we have come across. The articles, written in great part by men of acknowledged ability, contain a large amount of useful knowledge, forming a store of information from which workers in every rank of the art may obtain something that will interest them.

One of the chief features of the volume is the great increase in number of illustrations, which are printed by the various kinds of processes now available, and which show the advancement made in the application of photography for purposes of illustration.

The usual collection of tables is presented at the end. Among them may be mentioned Dr. Woodman's table of view angles, tables for the simplification of emulsion calculations, and tables of comparative exposures. The work concludes with a revised list of the Photographic Societies of the British Isles, British Colonies, America, and most of those on the Continent.

## LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

### The Discharge of Electricity through Gases.

IN the Bakerian lecture on "The Discharge of Electricity through Gases," in the last number of the Proceedings of the Royal Society, Prof. Schuster says:—"I do not see how the insulating power of air at the ordinary temperature is consistent with the presence of ions, however few in nnmber, for ultimately a diffusion to the electrodes and a discharge would necessarily take place. This seems to me to be fatal to J. J. Thomson's view of the disruptive discharge."

This statement implies a misconception of the theory of the electric discharge advanced by me in the *Philosophical Magazine*, June 1883, for there is nothing in the theory of the discharge there given which makes the presence of free ions in air at ordinary temperatures and pressures essential. I will quote two sentences from the paper to show what the theory is:—"In order to make the spark pass through an elementary gas, we have to decompose the molecules into atoms. Thus the stronger the connection between the atoms in the molecules, the greater the electric strength." "Chemical decomposition is not to be considered merely as an accidental attendant on the electrical discharge, but as an essential feature of the discharge, without which it could not occur."

The misconception has, no doubt, arisen from my using in the same paper the Clausius-Williamson hypothesis of the interchange of atoms among the molecules to account for the difference of pressure in different directions in the electric field. But this hypothesis is not essential to the theory of the *discharge* given in the paper, for on that theory the discharge does not take place until *ordinary* dissociation of the molecules is produced by the electric field. The existence or non-existence of the quasi-dissociation of the Clausius-Williamson hypothesis which does not produce any chemical effects, does not affect the theory of the discharge, though it does that of the inequality of pressure.

J. J. THOMSON.

Cambridge, July 19.

### Birds and Flowers.

IN your note on Mr. G. F. Scott-Elliot's paper on this subject (NATURE, July 17, p. 279) you remark: "In accordance with the view of Darwin, but opposed to that of Wallace, Mr. Scott-Elliot believes that the identity of colour (an unusual shade of red) in the majority of ornithophilous flowers and on the breasts of species of *Cinnyris* is an important element in pollination by birds." There must be, I think, some misapprehension here. I am not aware that Darwin has anywhere referred to the colours of birds as being generally similar to those of the flowers they frequent. Mr. Grant Allen has done so in his work on "The Colour-Sense," and I have opposed his views in NATURE (vol. xix. p. 501), because he founds the resemblance on the theory of sexual selection, and because the facts do not support any such general relation. That such a relation does sometimes occur I have shown, by quoting Mrs. Barber in my "Darwinism" (p. 201) as to the scarlet and purple colours of a sun-bird being highly protective when feeding among the similarly coloured blossoms of the *Erythrina caffra*, which, at the time, has no foliage. I have also called attention (in the same work, p. 319) to the numerous flowers now known to be fertilized by birds, and to the numerous large tubular flowers of a red and orange colour in Chile and the Andes, which are apparently adapted to be fertilized by humming-birds. The general uniformity of colour would be advantageous as an indication of bird-flowers as distinguished from insect-flowers; but there is no similarity to the colours of the birds. Curiously enough, the common Chilian Eustephanus is green-coloured in both sexes, while its close ally in Juan Fernandez is red in the male. Yet the flowers it frequents in the island are not red, but mostly white and yellow (see "Tropical Nature," p. 272). It is evident, therefore, that the prevalent colours of the flowers do not determine the colours of the birds which frequent them, unless those colours are so predominant that a similar colour becomes protective, as is more generally the case in the scantily-wooded plains of South Africa than anywhere else.

ALFRED R. WALLACE.

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